Spatial and Temporal Changes in Pinto Abalone *(Haliotis kamtschatkana)* Abundance at Ten Index Sites in the San Juan Archipelago

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Declining populations of pinto abalone *(Haliotis kamtschatkana)* have been monitored by the Washington Department of Fish and Wildlife (WDFW) in the San Juan Archipelago. WDFW divers have periodically tested for differences in density and size at ten permanent index sites (1992, 1994, 1996 and 2003). A decrease in total abundance occurred from 1992 to 1994 (n=351 to n=288) that, combined with additional anecdotal information, resulted in the closure of the fishery in 1994. Analysis of 1994 to 2003 data shows significant decreases in densities at five of the ten stations. The density from nine of the stations surveyed in 2003 were < 0.15 abalone/m2. The mean size of abalone at all sites has increased 12 mm (100 mm / 1994 vs. 112 mm 2003). Length frequency data from 2003 at five sites showed no abalone less than 95 mm. Literature suggests that sedentary invertebrates, such as abalone, must be within 1.0-2.0 m of one another (d > 0.33-0.15 abalone/m2) for successful fertilization. These data are indicative of "Allee Effect" response to low population densities and corroborate the actions of WDFW (1996) and NOAA Fisheries (2004) to list pinto abalone as a "Species of Concern".